

CLAIMS

What is claimed is:

1 1. A recording medium comprising:

2 predetermined recording units in which audio data is recorded, and additional data
3 related to the audio data is recorded in a predetermined location in corresponding ones of the
4 recording units of the audio data.

1 2. The recording medium of claim 1, wherein each recording unit has at least one

2 audio pack in which the audio data is recorded, and the additional data is recorded separately
3 from the related at least one audio pack.

1 3. The recording medium of claim 2, wherein the additional data is recorded in the

2 corresponding recording unit so as to be reproduced in relation to the related at least one audio
3 pack.

1 4. The recording medium of claim 2, wherein the additional data is recorded in

2 real-time information packs which is to be real-time reproduced by being synchronized to the
3 related audio data included in the corresponding audio packs.

1 5. The recording medium of claim 4, wherein the additional data comprises text

2 data, and the real-time information form corresponding real-time text information (RTI) packs
3 each having the text data and synchronization information of the text data corresponding to the
4 related audio data included in the same recording unit.

1 6. The recording medium of claim 5, wherein the synchronization information

2 comprises reproducing-time information of the text data, and the reproducing-start time of the
3 text data is located in a reproducing duration of the same recording unit.

4 7. The recording medium of claim 1, wherein the additional data is formed in units
5 of real-time text information (RTI) packs, and each recording unit has a plurality of the audio
6 packs and one of the RTI packs positioned at a first position in the recording unit.

1 8. The recording medium of claim 1, wherein the additional data is formed in units
2 of real-time text information (RTI) packs, and each recording unit has a plurality of the audio
3 packs and one of the RTI packs positioned at a second position in the recording unit after one
4 of the audio packs positioned at a first position in the recording unit.

1 9. A recording method of recording audio data and additional data related to the
2 audio data, the recording method comprising:

3 recording the audio data in predetermined recording units; and
4 recording the additional data in a predetermined location in corresponding ones of the
5 recording units.

1 10. The method of claim 9, wherein each recording unit includes at least one audio
2 pack in which the audio data is recorded, and the additional data is recorded separately from
3 the related at least one audio pack.

1 11. The method of claim 10, wherein the recording of the additional data comprises
2 recording the additional data so as to be reproduced in relation to the related at least one audio
3 pack.

1 12. The method of claim 11, wherein the additional data is recorded in real-time
2 information packs which is to be real-time reproduced by being synchronized to the related
3 audio data included in the corresponding audio packs.

1 13. The method of claim 12, wherein the additional data comprises text data, and
2 the real-time information packs are real-time text information (RTI) packs each having the text
3 data and synchronization information of the text data corresponding to the related audio data
4 included in the same recording unit.

1 14. The recording medium of claim 9, wherein the additional data is formed in units
2 of real-time text information (RTI) packs, and each recording unit has a plurality of the audio
3 packs and one of the RTI packs positioned at a first position in the recording unit.

1 15. The recording medium of claim 9, wherein the additional data is formed in units
2 of real-time text information (RTI) packs, and each recording unit has a plurality of the audio
3 packs and one of the RTI packs positioned at a second position in the recording unit after one
4 of the audio packs positioned at a first position in the recording unit.

1 16. A reproducing method of reproducing data from a recording medium wherein
2 audio data is recorded in predetermined recording units and additional data related to the audio
3 data is recorded in a predetermined location in the corresponding recording units of the audio
4 data, the reproducing method comprising:

5 reading data from the recording medium in units of the recording units; and
6 reproducing the audio data and the additional data recorded in the read recording units,
7 after relating the additional data to the audio data.

1 17. The method of claim 16, wherein each recording unit has at least one audio pack
2 in which the audio data is recorded, and the additional data is recorded separately from the
3 related at least one audio pack.

1 18. The method of claim 17, wherein the additional data is recorded in the
2 corresponding recording unit so as to be reproduced in relation to the related at least one audio
3 pack.

1 19. The method of claim 18, wherein the additional data is recorded in real-time
2 information packs as real-time information on the recording medium, and the reproducing of
3 the audio data and the additional data comprises real-time reproducing the additional audio data
4 by synchronizing the additional data to the related audio data included in the same recording
5 unit.

1 20. The method of claim 19, wherein the additional data comprises text data, and
2 the real-time information pack are real-time text information (RTI) packs each having the text
3 data and synchronization information of the text data corresponding to the related audio data
4 included in the same recording unit.

1 21. The method of claim 19, wherein the synchronization information comprises
2 reproducing-time information of the text data, and the reproducing-start time of the text data is
3 located in a reproducing duration of the recording unit.

1 22. The method of claim 16, wherein the additional data is formed in units of real-
2 time text information (RTI) packs, and each recording unit has a plurality of the audio packs
3 and one of the RTI packs positioned at a first position in the recording unit.

1 23. The method of claim 16, wherein the additional data is formed in units of real-
2 time text information (RTI) packs, and each recording unit has a plurality of the audio packs
3 and one of the RTI packs positioned at a second position in the recording unit after one of the
4 audio packs positioned at a first position in the recording unit.

1 24. A recording apparatus comprising:

2 an audio signal processor encoding input audio data to generate at least one audio pack,
3 and combining the at least one audio pack to generate an audio object unit (AOBU) that is a
4 predetermined recording unit;

5 a real-time text information (RTI) signal processor encoding additional data related to
6 the audio data to generate an RTI pack;

7 a multiplexor generating a new AOBUs having the additional data by including the RTI
8 pack provided from the RTI signal processor in the AOBUs provided from the audio signal
9 processor; and

10 a recording controller recording the AOBUs generated by the multiplexor.

1 25. The recording apparatus of claim 24, wherein the multiplexor multiplexes the at
2 least one audio pack and the RTI pack so that the additional data recorded in the RTI pack is
3 reproducible in relation to the audio data included in the new AOBUs.

1 26. The recording apparatus of claim 25, wherein the RTI pack has text data and
2 synchronization information of the text data corresponding to the audio data included in the
3 new AOBUs.

1 27. The recording apparatus of claim 26, wherein the synchronization information
2 includes reproducing-time information of the text data, and the reproducing-start time of the
3 text data is located in a reproducing duration of the new AOBUs.

1 28. The recording apparatus of claim 24, wherein the audio signal processor
2 combines a plurality of the audio packs to generate the AOBUs, and the multiplexor inserts the
3 RTI pack at a first position in the AOBUs.

1 29. The recording apparatus of claim 24, wherein the audio signal processor
2 combines a plurality of the audio packs to generate the AOBUs, and the multiplexor inserts the

3 RTI pack at a second position in the AOBU after one of the audio packs positioned at a first
4 position in the AOBU.

1 30. A reproducing apparatus for reproducing data from a recording medium wherein
2 audio data is recorded in predetermined recording units and additional data related to the audio
3 data is recorded in a predetermined location in the recording unit of the audio data, the
4 reproducing apparatus comprising:

5 a reproducing controller reading an audio object unit (AOBU) which is one of the
6 recording units;

7 a demultiplexor demultiplexing an audio pack in which audio data is recorded and an
8 RTI pack in which additional data is recorded, from the read AOBU;

9 an audio signal processor decoding the audio pack demultiplexed by the demultiplexor
10 to output the audio data stored in the audio pack; and

11 an RTI signal processor decoding the RTI pack demultiplexed by the demultiplexor to
12 output additional data stored in the RTI pack in relation to the audio data from the audio pack.

1 31. The reproducing apparatus of claim 30, wherein the RTI signal processor
2 outputs text data included in the RTI pack after synchronizing the text data to the audio data
3 from the audio pack.

1 32. The reproducing apparatus of claim 30, wherein the demultiplexor
2 demultiplexes a plurality of audio packs from the read AOBU, and the RTI pack at a first
3 position in the read AOBU.

1 33. The recording and/or reproducing apparatus of claim 32, wherein the
2 demultiplexor demultiplexes a plurality of audio packs from the read AOBU, and the RTI pack
3 at a second position in the read AOBU after one of the audio packs positioned at a first position
4 in the read AOBU.

1 34. A recording and/or reproducing apparatus comprising:

2 an audio signal processor encoding input audio data to generate at least one audio pack
3 and combining the at least one audio pack to generate an audio object unit (AOBU) which is a
4 predetermined recording unit, when data is recorded, and

5 decoding the at least one audio pack demultiplexed from a new AOBU by a
6 demultiplexor to output the audio data, when the data is reproduced;

7 a real-time text information (RTI) signal processor encoding additional data related to
8 the audio data to generate an RTI pack which is an additional pack when the data is recorded,
9 and decoding the RTI pack demultiplexed from the new AOBU by the demultiplexor to output
10 the additional data in relation to the audio data when the data is reproduced;

11 a multiplexor/demultiplexor including the RTI pack provided from the RTI signal
12 processor in the AOBU provided from the audio signal processor to generate a new AOBU
13 having the additional data, and when the data is reproduced, demultiplexing the at least audio
14 pack in which audio data is recorded and RTI pack in which the additional data is recorded,
15 from the new AOBU; and

16 a recording/reproducing controller recording the new AOBU generated by the
17 multiplexor on a recording medium, reading the new AOBU, which is a recording unit, from
18 the recording medium, and providing the new AOBU to the multiplexor/demultiplexor.

1 35. The recording and/or reproducing apparatus of claim 32, wherein the RTI pack
2 has text data and synchronization information of the text data corresponding to the audio data
3 included in the AOBU.

1 36. The recording and/or reproducing apparatus of claim 33, wherein the
2 synchronization information comprises reproducing-time information of the text data, and the
3 reproducing-start time of the text data is located in a reproducing duration of the new AOBU.

1 37. The recording and/or reproducing apparatus of claim 34, wherein the audio
2 signal processor generates a plurality of the audio packs to generate the AOBU and the
3 multiplexor/demultiplexor inserts the RTI pack at a first position in the AOBU, when the data
4 is recorded.

1 38. The recording and/or reproducing apparatus of claim 34, wherein the audio
2 signal processor generates a plurality of the audio packs to generate the new AOBU, and the
3 multiplexor/demultiplexor inserts the RTI pack at a second position in the AOBU after one of
4 the audio packs positioned at a first position in the AOBU, when the data is recorded.

1 39. A recording medium comprising:
2 recording units each comprising
3 at least one audio pack having audio data, and
4 a real-time text information (RTI) pack in a predetermined location within the
5 recording unit;
6 wherein at least some of the RTI packs have additional data related to the audio data
7 within the same recording unit.

1 40. The recording medium of claim 39, wherein ones of the RTI packs have no
2 information recorded therein.

1 41. . The recording medium of claim 39, wherein the RTI packs with the additional
2 data comprise:

3 the text data relating to the audio data in the same recording unit; and
4 an extra header having synchronization information to synchronize the text data with
5 the audio data in the same recording unit.

1 42. The recording medium of claim 41, wherein the recording units are audio object
2 units (AOBUs).

1 43. The recording medium of claim 41, wherein:
2 the recording units each comprise reproducing-start time information and reproducing-
3 end time information for the AOBUs; and
4 the synchronization information comprises reproducing-start time information of the
5 text data.

1 44. A recording medium comprising:
2 recording units in which audio data and additional data relating to the audio data are
3 separately or independently recorded in same ones of the recording units.

1 45. The recording medium of claim 44, wherein each recording unit comprises:
2 at least one audio pack having the audio data; and
3 an additional data pack having the additional data relating to the audio data in the at
4 least one audio pack.

1 46. A method of recording audio data and additional data relating to the audio data,
2 comprising:
3 separately or independently recording the audio data and the additional data in same
4 ones of predetermined units; and
5 recording the predetermined units on a recording medium.

1 47. The method of claim 46, wherein the separately or independently recording
2 comprises:

3 recording at least one audio pack in each of the predetermined units; and

4 recording a real-time information (RTI) pack in a predetermined location in each one of
5 the predetermined units, wherein at least some of the RTI packs have the additional data
6 relating to the audio data in the same ones of the predetermined units.

1 48. A method of reproducing audio data and additional data relating to the audio
2 data which are recorded separately or independently in same ones of predetermined recording
3 units, the method comprising:

4 reading the predetermined recording units; and

5 demultiplexing the predetermined units to separate the audio data from the additional
6 data.

1 49. The method of claim 48, wherein the predetermined recording units each
2 comprise at least one audio pack having the audio data and a real-time information (RTI) pack,
3 wherein at least some of the RTI packs have the additional data relating to the audio data in the
4 same ones of the predetermined units, the demultiplexing comprising:

5 separating the at least one audio pack for audio processing from the RTI pack for real-
6 time information processing.

1 50. A recording apparatus comprising:

2 an audio signal processor encoding input audio data to generate audio packs, and
3 combining pluralities of the audio packs to generate recording units;

4 a real-time text information (RTI) processor generating RTI packs, at least some of
5 which have additional data relating to the audio data;

6 a multiplexor generating each of the predetermined units by combining one of the
7 pluralities of audio packs with one of the RTI packs; and
8 a recording controller recording the predetermine units on a recording medium.

1 51. A reproducing apparatus for reproducing data from a recording medium,
2 wherein the recording medium has recording units each having audio packs a real-time text
3 information (RTI) pack, the reproducing apparatus comprising:
4 a reproducing controller reading the recording units from the recording medium;
5 and combining pluralities of the audio packs to generate recording units;
6 a demultiplexor demultiplexing the audio packs from the RTI pack for each recording
7 unit;
8 an audio signal processor decoding the audio packs demultiplexed by the demultiplexor;
9 and
10 an (RTI) processor decoding the RTI packs demultiplexed by the demultiplexor.